UNIT SUPPORT FOR FIELD GUNS AND ANTI-AIRCRAFT GUNS AND THE LIKE

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UNIT SUPPORT FOR FIELD GUNS AND ANTI-AIRCRAFT GUNS AND THE LIKE

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The present invention relates to a support intended to be used for field guns, anti-aircraft guns and the like, of the kind consisting of a circular bottom frame resting on three legs, on and in which bottom frame, a top frame or platform is revolved on an axle pin attached in a suitably sloping position on a head, in which a similar easy manner can be attached to the bottom frame in the place of the leg, the advantage being thereby attained that by replacing two of the legs of the gun support by the said wheels the gun support can be converted into a wheeled gun carriage with a stock (the third leg).

One construction of the invention is illustrated in the accompanying drawings, in which

Figure 1 is a side elevation of the mount with the legs attached and showing a gun in position.

Figure 2 is a plan view of Figure 1 but with the gun omitted.

Figure 3 is an enlarged detail section on the line II—III of Figure 2 and showing the manner of attaching the legs to the bottom frame.

Figure 4 is a detail section on the line IV—V of Figure 3.

Figure 5 is a detail section on the line V—V of Figure 3 and V—V of Figure 6, the view being to the same scale as Figure 5 and showing the manner of securing the platform on the bottom frame.

Figure 6 is an enlarged detail plan view showing the manner of securing the cheeks or bearing standards in place on the platform.

Figure 7 is a detail view on the line VII—VII of Figure 6.

Figure 8 is an enlarged detail section on the line VIII—VIII of Figure 2.

Figure 9 is an enlarged detail section on the line IX—IX of Figure 2 and showing the arrangement of the adjustable feet on the legs.

Figure 10 is an end elevation of the foot supporting end of a leg with the foot and its casing omitted.

Figure 11 is a detail view, partly in elevation and partly in section showing the manner in which the foot casing and foot may be attached directly to the bottom frame.

Figure 12 is a side elevation, similar to Figure 1 but showing the mount converted into a wheeled carriage.

Figure 13 is a plan view of the arrangement shown in Figure 12 but with the platform and parts above omitted.

Figure 14 is an enlarged detail, partly in elevation and partly in section and showing the manner of attaching the wheels to the bottom frame.

A are the three legs of the gun support, B the circular bottom frame, C the top frame adapted to be rotated therein and D the cheeks, or bearing standards, at the top of which is a cradle E for the gun F. G is the hand-wheel for the lateral-adjustment mechanism and H the hand-wheel for the vertical-adjustment mechanism of the gun, the first mentioned wheel having its shaft journaling in the top frame or platform and driving by a suitable transmission a pinion, which is in engagement with a toothed ring g on the inner side of the bottom frame. The wheel H is connected through a suitable transmission (not shown) in a housing H to a shaft consisting of sections h^1 and h^2, two of which are universally jointed at h^1 and between two of which sections is a controlling clutch h.' The terminal section h^2 is connected to gearing h^2 for vertical training of the gun.

At three points on the outside of the bottom frame, spaced 120° from one another, there are fitted vertical U-shaped shoes 20 which are open on the front sides, and are welded to the said bottom frame. Each shoe carries at the top a horizontal bolt 21, obliquely disposed relatively to the frame. Each shoe carries somewhat further down on the inside of each flange, a short but heavy pin 22, the said shoe being filled out at the bottom by means of a solid block, the locking block 23, which is attached to the shoe by welding.

Each of these three shoes 20 serves to hold the inner end of one leg A and to attach the same to the bottom frame B, the said leg which suitably is of T-shaped cross-section being fitted at the inner end with a clip 24 welded or otherwise secured in position. At the top of the clip 24 is a fork 25, which is adapted to engage the bolt 21 from below, forming together with the latter an open hinge 21, 25, while the said clip is fitted at the bottom with a toe 26, which extends in...
wardly toward the bottom frame and, after the fork 25 has been caused to engage the bolt 21, fits closely on top of the locking block 23. The top side of the locking block 23 is fitted with a deep transverse groove, and the bottom side of the toe 26 is fitted with a shallow groove confronting the first groove, the said two grooves forming together, when the leg is in position, a cylindrical bearing for a locking bolt 27, which is partly cut off on one side and has exactly the same cross-section as the groove in the locking block, in such a manner that the said bolt by being turned all the way down into the recess will give free passage for the toe 26 closely above the locking block, while the said bolt, when the same, after the leg has been brought into position, is turned through a suitable angle, will be projecting up into the cylindrical groove in the bottom face of the toe and, thereby will lock the latter and the locking block 23 and, thereby, the leg and the bottom frame relatively to one another. The locking bolt may be non-rotatively mounted in a yoke member 28, which from a hanging position corresponding to free passage for the toe can be swung up into a horizontal position, whereby the locking bolt will be brought into its locking position. The said yoke member is arranged to be fixed in the last mentioned position by means of a threaded spindle 30 fitted with a hand wheel 29, for which spindle the central part of the said yoke member forms the nut, and screwed with its pin-shaped point into a corresponding hole 31 in the rear side of the locking block, where it is held in position by means of a clamping ring 32 adapted to slide transversely in the central part of the said yoke member. A threaded pin 33 projects from the ring out through the side of the said central part of the yoke and is fitted with a nut 34, which by being screwed up against the central piece effects a lateral motion of the clamping ring 32 so as to press the latter against the spindle 30.

It will be seen that after the lock 23, 27, 26 has been opened, the leg can be detached from the bottom member.

Instead of the hinge bolt 21 and the fork 25 being disposed at the top and the fork opening upwardly, the parts mentioned here may be situated at the bottom, and the fork be open at the bottom, the locking device being then situated at the top. Such a construction offers the advantage that the locking part of the roller does not have to be actuated so forcibly, as care can then be taken that the end of the leg shall then, at the top, rest against the front edges of the side flanges of the shoe 35, in such a manner that the pressure from the top edge of the leg against the bottom frame will be resisted there, while the pull acting on the bottom frame, at the bottom side of the leg will be transmitted through the hinge, which will be able to transmit these forces better than the lock.

Instead of a hinge bolt 21 running through and a broad fork 25 being used a short hinge pin 22 may be used in each of the flanges of the shoe and a fork 23 for each such pin— as shown by the connection, later described, between the foot end of the leg and the frame for the adjustable foot of the same in Fig. 11.

Instead of the described locking device 23, 27, 26 there may be used any other suitable locking device, for instance the toe 26 on the member 24 of the leg may form an eyeclet—horizontal or vertical—into which a pin can be inserted, the said pin being adapted to move vertically or horizontally, respectively, or to swing forward in the shoe 20 of the bottom frame, as shown by the connection, later described, between the foot end of the leg and the casing for the adjustable foot of the same as fitted in Fig. 11.

For taking up the outward bending moment originating from the legs and acting on the part of the shoes 20 that projects below the bottom frame itself, the said shoes are preferably interconnected by means of stays 30.

The top frame or platform C, which is rotatable in and on the bottom frame B, is but secured against detachment from the bottom frame, as long as the support is in use, is fitted with the cylinders 39 andguide rollers 37, which latter, besides centering the top frame in the bottom frame, also serve to hold the two frames together and, for that purpose are fitted with a flange engaging the bottom side of a peripheral circular part of the bottom frame.

In order to enable the top frame and the bottom frame to be separated from one another when desired the guide rollers 37 are each journaled on a pin 36 disposed eccentrically on the bottom end of a cylinder 39, which is pivoted in the top frame. As soon as the locking device is releasably locked to the top frame in the position in which the rollers are in engagement with the bottom frame and, suitably, also in another, preferably diametrically opposite position, in such a manner that, after the cylinders 39 have been released and readjusted, to disengage the rollers 37 from the bottom frame, the top frame can be lifted from the bottom frame. In the construction shown the said locking device consists of a locking arm 41 pivoted at the top end of the cylinder 39 to swing about a horizontal shaft 40. One end of this arm is engaged by a pin 43 journaled in the cylinder and actuated by a spring 42, the result being that the other end thereof will be held down in one or the other one of two preferably diametrically opposed notches 44 (see Fig. 6) in a ring 45 connected rigidly to the top frame, but can be lifted out from the same and then together with the cylinder be turned to engagement with the other notches.

In the construction shown for the gun support, the supporting frame D, which preferably consists of two mainly vertical cheek walls 47 connected at the front by a base plate 48, is connected to the top frame by being held at the front between the shoes 35 of the top frame and by engaging means of a flange 49 beneath a flange 50 on the periphery of the top frame (see Fig. 8). The frame is further locked at its rear to the top frame by means of bolts 52 adapted to slide in barrels or cylinders 51 fixed on the said top frame. Each bolt 52 engages a suitably conical hole 53 at the rear end of each of the cheeks. When the bolt 52 is pulled out from the hole 53, the supporting frame can be pushed forward in such a manner that the flange 49 is freed from the flange 50, after which the supporting frame can freely be removed from the top frame, since by the said displacement of the cheeks also the two parts of the elevation-adjuster shaft H have been disconnected from one another by separation of the parts of the clutch coupling R. The bolt 52 is fixed at the rear end and is journaled in the cylindrical barrel 51. Each bolt is fitted with a handle lever 54, working in a bayonet slot 55 in the outer end of the barrel, as common in bolts, thus allowing the bolt to be locked in the opening 56 but permitting the bolt to be withdrawn from said opening.
The cheeks may at the front be connected to the top frame by means of a dove-tail connection instead of by means of a clutch and lateral guides, and the locking device at the rear may be of any other known suitable construction than the one here described, and the locking device, instead of being disposed at the rear, may be disposed at the front, the dove-tail connection or the clutch connection having then correspondingly different means of assembly. A foot 59 is provided at the outer end of each of the legs A, which foot is adjustable with respect to a foot casing 60 in vertical direction by means of an adjusting screw 58 provided with a hand-wheel 57. The foot casing 60, is detachably connected to the leg A itself, in similar manner the connection of the top end of the leg to the bottom frame, and by means of connecting and locking members also can be attached directly to the bottom frame in the place of the leg, although it should be noted that if the cross-sectional depth of the leg is smaller at the foot end than at the top end, then the side flanges of the shoes of the bottom frame must be fitted with special hinge pins—the above mentioned pins 25—below the hinge bolt 21 for the fork of the leg.

The forks 125 engage here same height as the top end of the legs. This head forms at the top a fork 225 corresponding to the fork 25 on the top clip 24 of the legs, and is to be disposed in a box or a heavy bottom plate 226, corresponding to the toe 26 on the said clip and with a cylindrical shallow recess in the bottom face exactly like the said toe, so that each of the wheels with the axle head belonging thereto can immediately be attached and locked to the bottom frame in place of one of the legs, the gun support being thereby converted into a wheeled gun carriage with a stock or trail formed by the third leg.

Having thus described my invention, what I claim is:

1. A unitary support for field guns, anti-aircraft guns and the like, comprising a circular bottom frame, means rigidly but detachably connected to the bottom frame for supporting the same at three points equally spaced around its circumference, a top frame mounted to roll on and said bottom frame, and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

2. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means rigidly but detachably connected to the bottom frame for supporting the same at three equally spaced points, the connecting means comprising an open hinge, and a locking device for said hinge, a top frame mounted to roll on and said bottom frame, and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

3. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame at equally spaced points around its circumference, said means consisting of three radial, slightly sloping legs rigidly but detachably connected to said bottom frame, a top frame mounted to roll on and said bottom frame, and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

4. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame at equally spaced points around its circumference, said means including an open hinge consisting of a bolt extending perpendicularly to the vertical plane of the leg in one of the parts to be hinged together and a fork on the other part encircling said bolt, said connecting means further including a locking bolt fastened at one side and pivotally connected in one of the parts opposite to said hinge and cooperating with a segmental bearing surface formed in the other part, a top frame mounted to roll on and said bottom frame, and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

5. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame at equally spaced points around its circumference consisting of three radial, slightly sloping legs, each leg being rigidly but detachably connected to said bottom frame by connecting means including an open hinge consisting of a bolt extending perpendicularly to the vertical plane of the leg in one of the parts to be hinged together and a fork on the other part encircling said bolt, said connecting means further including a locking bolt fastened at one side and pivotally connected in one of the parts opposite to said hinge and cooperating with a segmental bearing surface formed in the other part, a top frame mounted to roll on and said bottom frame, and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.
4. means including an open hinge formed by the parts, and a locking device consisting of a pin longitudinally slidably in one of the parts transversely to said hinge for cooperation with an eye on the other part opposite said hinge, a top frame mounted to roll on and in said bottom frame, and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

6. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame at equally spaced points around its circumference, consisting of three radial, slightly sloping legs, each leg being rigidly but detachably connected to said bottom frame by connecting means including an open hinge consisting of two co-axial pins on one of the parts to be hinged together and two forks on the other part each engageable with one of said pins, said connecting means further including a locking device opposite to said hinge, a top frame mounted to roll on and in said bottom frame, and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

7. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame at equally spaced points around its circumference, consisting of three radial, slightly sloping legs rigidly but detachably connected to the bottom frame, an end piece rigidly but detachably connected to each of said legs by means of identical form and size to the means for connection of the legs to the bottom frame so as to be able of being rigidly but detachably connected to said frame in substitution of a leg, a top frame mounted to roll on and in said bottom frame, and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

8. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame at equally spaced points around its circumference, said means consisting of three legs sloping in radial planes and rigidly but detachably connected to the bottom frame, an end piece rigidly but detachably connected to each of said legs, a foot vertically adjustable in each of said end pieces, a top frame mounted to roll on and in said bottom frame and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

9. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame at equally spaced points around its circumference, said means consisting of three radial, slightly sloping legs rigidly but detachably connected to said bottom frame, two wheel axle pins, each with a wheel thereon and having a head forming to the head end of the legs so as to be capable of being rigidly but detachably connected to the bottom frame in substitution of a leg, a top frame mounted to roll on and in said bottom frame, and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

10. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame rigidly but detachably connected to the same at three equally spaced points of its circumference, a top frame fitted with conical rolls and rolling on the top side of the circular bottom frame, said bottom frame also being provided with flanged rollers rolling beneath the edges of the circular bottom frame and having their flanges projecting beneath the bottom frame to prevent the top frame from being lifted up from the bottom frame and cheeks rigidly but detachably arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

11. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame rigidly but detachably connected to the same at three equally spaced points of its circumference, a top frame fitted with conical rolls and rolling on the top side of the circular bottom frame and also fitted with flanged rollers rolling around the periphery of the circular bottom frame and having their flanges projecting under this frame, said flanged rollers being each pivoted about an eccentric pin at the outer end of a cylinder journaled in the top frame and adapted with a device for locking the top frame in a position with its flanged roller projecting under the bottom frame and also in a position with the flanged frame to be lifted out of the bottom frame, and cheeks arising from said top frame and adapted to support the trunnions of a gun or gun cradle.

12. A unitary support for field guns, anti-aircraft guns and the like comprising a circular bottom frame, means for supporting said bottom frame rigidly but detachably connected to the same at three equally spaced points of its circumference, a top frame mounted to roll on and in said bottom frame, cheeks arising from said top frame adapted to support the trunnions of a gun or gun cradle, and connecting means for rigidly but detachably connecting the cheeks to the top frame and including lugs on the top frame preventing lateral movement of the cheek, a flange engaging beneath a peripheral portion of the top frame and preventing backward movement of the cheeks and bolts on the top frame adapted to slide laterally of the rear part of the cheeks, and engaging conical holes in the rear part of the cheeks for preventing forward movement of the cheeks and also together with the said flange preventing the cheeks from being lifted up from the top frame.

13. In a gun mount, a frame, brackets forming channel-like shoes carried by said frame to open outwardly, a hinge pin for each bracket extending transversely of the shoe, a supporting member for each shoe and having a securing device extending from its inner end, said securing device having a vertically extending fork notch for swinging engagement on said pin, a toe on said securing device spaced from said notch, and releasable locking means consisting of a shoe and toe to hold the supporting member from swinging on said pin.

14. In a gun mount, a frame, brackets forming channel-like shoes carried by said frame to open outwardly, a hinge pin for each bracket extending transversely of the shoe, a supporting member for each shoe and having a securing device extending from its inner end, said securing device having a vertically extending fork notch for swinging engagement on said pin, a toe on said securing device spaced from said notch, and releasable locking means consisting of a shoe and toe resting on said block in locking position.
said toe and block having their confronting faces provided with complementary segmento-cylindrical grooves with the groove in the block deeper than the groove in the toe, a locking pin rotatably mounted in the groove in the block and flattened on one side to have its flat face flush with the surface of the block in release position, said pin upon rotation from release position extending into the toe groove to lock the toe against movement on the block, and means to rotate said pin.

15. In a gun mount, a frame, brackets forming channel-like shoes carried by said frame to open outwardly, a hinge pin for each bracket extending transversely of the shoe, a supporting member for each shoe and having a securing device extending from its inner end, said securing device having a vertically extending fork notch for swinging engagement on said pin, a toe on said securing device spaced from said notch, a locking block at the end of the shoe remote from said pin, said toe resting on said block in locking position, said toe and block having their confronting faces provided with complementary segmento-cylindrical grooves with the groove in the block deeper than the groove in the toe, a locking pin rotatably mounted in the groove in the block and flattened on one side to have its flat face flush with the surface of the block in release position, said pin upon rotation from release position extending into the toe groove to lock the toe against movement on the block, a yoke having its arms fixedly engaged on said pin and having its middle part swingingly movable around the block, and a threaded bolt extending through said middle part toward the pin, said block having a recess wherein the end of the bolt may engage when the locking pin is in locking position.

16. In a gun mount, a bottom frame including a circular frame member having a roller track on its upper face, a platform having outer and inner depending flanges straddling said track, rollers between said flanges resting on said track and supporting the platform, other rollers carried by the platform and movable into and out of position beneath said frame member, and means to effect said movements of said last rollers.

17. In a gun mount, a bottom frame including a circular frame member having a roller track on its upper face, a platform having outer and inner depending flanges straddling said track, rollers between said flanges resting on said track and supporting the platform, vertical shafts journalled in said platform within said circular member, a pin projecting downwardly from and eccentric to each shaft, a roller on each pin movable by rotation of the shaft between positions of engagement beneath and freedom from said circular member, a latch tiltably mounted on the upper end of each shaft to form rotating means for the shaft, a ring on the platform surrounding the upper end of each shaft and having notches for the latch corresponding to the positions of engagement and release of the last mentioned roller, and spring means urging the latch into said notches.

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